AP Statistics Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ch. 23 & 24 Classwork Date: \_\_\_\_\_\_\_\_\_\_\_\_ Block: \_\_\_

1. A professor at a large university believes that students take an average of 15 credit hours per term. A random sample of 24 students in her class of 250 students reported the following number of credit hours that they were taking:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 13 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 16 |
| 17 | 17 | 17 | 18 | 18 | 18 | 18 | 19 | 19 | 19 | 20 | 21 |

1. Does this sample indicate that students are taking ***more*** credit hours than the professor believes? Test an appropriate hypothesis and state your conclusion.
2. Find a 95% confidence interval for the number of credit hours taken by the students in the professor’s class. Interpret your interval.
3. What does 95% confidence mean in this context?
4. Interpret your p-value from part (a).
5. If your conclusion from part (a) was wrong, what type of error did you make?
6. What would a Type I error be in this context?
7. What would a Type II error be in this context?

|  |  |  |
| --- | --- | --- |
| Composite ACT Score | | |
| Non-athletes | | Athletes |
| 25 | 21 | 22 |
| 22 | 27 | 21 |
| 19 | 29 | 24 |
| 25 | 26 | 27 |
| 24 | 30 | 19 |
| 25 | 27 | 23 |
| 24 | 26 | 17 |
| 23 | 23 |  |

1. A total of 23 Gossett High School students were admitted to State University. Of those students, 7 were offered athletic scholarships. The school’s guidance counselor looked at their composite ACT scores (shown in the table), wondering if State U. might admit people with lower scores if they also were athletes. Assuming that this group of students is representative of students throughout the state, what do you think? Do the Athletes have lower ACT scores than the Non-athletes?

a) Test an appropriate hypothesis and state your conclusion.

b) Create and interpret a 95% confidence interval.

c) Does your interval indicate that there is a difference between athletes and non-athletes ACT scores? Justify. Does this match your conclusion in part (a)?

d) What level of confidence should you have used? (what level of confidence “matches” your test?)

e) Interpret your P-value from part (a) in context.

d) What would a Type II error be in context?

e) What would Power be in this context?